

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

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NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing
(day/month/year)

13.02.2006

Applicant's or agent's file reference
AWP/76638WO00

IMPORTANT NOTIFICATION

International application No.
PCT/GB2005/000117

International filing date (day/month/year)
14.01.2005

Priority date (day/month/year)
14.01.2004

Applicant

LOTUS CARS LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

RECEIVED

13 FEB 2006

**BOULT WADE
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference AWP/76638WO00	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/GB2005/000117	International filing date (day/month/year) 14.01.2005	Priority date (day/month/year) 14.01.2004	
International Patent Classification (IPC) or national classification and IPC F02B37/007, F02B37/02, F02B37/013, F02D13/02, F02B29/04, F01L9/02			
Applicant LOTUS CARS LIMITED et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 7 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 03.11.2005		Date of completion of this report 13.02.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31.651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Boye, M Telephone No. +31 70 340-3864	



INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY

10/585588
AP20 Rec'd PCT/PTO 11 JUL 2006
International application No.
PCT/GB2005/000117

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

3-7	as originally filed
1, 2, 2a	received on 04.11.2005 with letter of 03.11.2005

Claims, Numbers

1-10	received on 04.11.2005 with letter of 03.11.2005
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Drawings, Sheets

1/1	as originally filed
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- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2005/000117

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-10
	No: Claims	
Inventive step (IS)	Yes: Claims	1-10
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/GB2005/000117

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following document:

D1 : US 4 959 961 A (HIERETH ET AL) 2 October 1990 (1990-10-02)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):
an internal combustion engine comprising a combustion chamber (1), first and second inlet valves (3,2) controlling flow of air into the combustion chamber (1), first and second exhaust valves (5,4) controlling flow of combusted gases out of the combustion chamber (1), first and second turbochargers (19,8), the first turbocharger (19) being connected to the first inlet valve (3) and the second turbocharger (8) being connected to the second inlet valve (2) where charge air supplied to the combustion chamber via the first inlet valve (3) is pressurised only by the first turbocharger (19) and charge air supplied to the combustion chamber via the second inlet valve (2) is pressurised only by the second turbocharger (8), where the first turbocharger (19) is connected to the first exhaust valve (5) and receives only combusted gases expelled via the first exhaust valve (5) and the second turbocharger (8) is connected to the second exhaust valve (4) and all combustion gases expelled via the second exhaust valve (4) flow to the second turbocharger (8) without passing through the first turbocharger (19), where a valve operating means controls operation of the first inlet valve (3) and the first exhaust valve (5) (cf. col. 3, ll. 67 - col. 4, ll. 2) independently from the operation of the second inlet valve (2) and second exhaust valve (4) thereby providing variation in the ratio of the mass of charge air supplied to the combustion chamber via the first inlet valve (3) to the mass of charge air supplied to the combustion chamber via the second inlet valve (2), where the valve operating means is controlled by an electric controller to vary operation of the inlet and exhaust valves and thereby the turbochargers having regard to changes in engine operating conditions, the controller being able to select between different modes of operations, including a first operating mode in which the valve operating means deactivates the second inlet valve (2) and the second exhaust valve (4) whereby all charge air supplied to the combustion

chamber is pressurised by the first turbocharger (19) and delivered via the first inlet valve (3) and a second operating mode in which the valve operating means operates simultaneously the first and second inlet valves and the first and second exhaust valves whereby charge air supplied to the combustion chamber is pressurised by both the first and second turbochargers and delivered via both the first and second exhaust valves.

The subject-matter of claim 1 differs from this known internal combustion engine in that the controller can also select a third operating mode in which the valve operating means deactivates the first inlet valve and the first exhaust valve whereby all charge air supplied to the combustion chamber is pressurised by the second turbocharger and delivered via the second inlet valve.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as better and more efficient charging and operation of an engine having four valves and two turbochargers.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The completely allows to control the first and second turbocharger which are exclusively linked to their corresponding valves independently from one another. This results in advantages when supercharging the combustion engine at steady speed and during acceleration.

None of the documents cited in the search report discloses an internal combustion engine having an independent control of the first and second exhaust valve and the first and second inlet valve. A skilled person could use waste gates, variable turbine geometries, throttle flaps, or control the first inlet and exhaust valve to control one turbocharger. In JP 6+210224, the first inlet valve connected to the first turbocharger and the second outlet valve connected to the second turbocharger were controlled but not all four valves.

Claims 2-10 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII.

4. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 4.1 The closest prior art D1 should be mentioned in the description (Rule 5.1(a)(ii) PCT).
- 4.2 On page 4, line 29, it should read "valve **operating** mechanism".
- 4.3 In claim 1, line 24, it could be written "...by **the** first...".

Re Item VIII.

5. Claim 1 is unclear (Article 6 PCT) insofar as the controller "**can also** select a third..." so that it is not clear that the controller has this third technical feature. The claim should be amended to "**is capable to** select a third..."
- 5.1 The reference in the amended dependent claim 8 should be amended to refer to claim 7.